

Remarks

Claims 1, 3-19, 21, and 22 were pending in the present application. Claim 7 has been canceled. Claim 21 has been withdrawn from consideration. New claim 23 has been added. Because support for new claim 23 may be found, e.g., in Fig. 2, no new matter has been added. Therefore, claims 1, 3-6, 8-19, and 21-23 are now pending, with claim 21 withdrawn from consideration.

Allowable Subject Matter

Examiner Zec is sincerely thanked for indicating that claims 8-10 are allowed.

Finality of the Office Action

The finality of the Office Action is respectfully traversed, for at least the following reasons.

First, a second action on the merits “shall be made final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant’s amendment of the claims nor based on information submitted in an information disclosure statement...”. MPEP 706.07(a), emphasis added. In the first Office Action, claim 2 was rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,349,560 to Maier-Laxhuber (hereinafter “Maier”). In the final Office Action, claim 1 was rejected under 35 U.S.C. §103(a) as being obvious over Maier in view of U.S. Patent No. 4,766,732 to Rubin (hereinafter “Rubin”).

However, in Applicant’s Amendment and Reply (“A&R”) filed on June 20, 2005, Applicant amended claim 1 to include almost all limitations of original claim 2, and then canceled claim 2. In other words, amended claim 1 is substantively almost identical to original claim 2. Therefore, because claim 1 is now rejected under §103(a) (over Maier and Rubin), while original claim 2 was rejected under only §102(b) (over Maier only), the rejection to claim 1 represents a new ground of rejection that was neither necessitated

by Applicant's amendment of the claims nor based on information submitted in an information disclosure statement.

Second, in the first Office Action, claim 12 was rejected under 35 U.S.C. §102(b) as being anticipated by Maier. In the final Office Action, claim 12 was rejected under 35 U.S.C. §103(a) as being obvious over Maier in view of Rubin and U.S. Patent Application Publication No. 2005/0061006 to Bonaquist et al. (hereinafter "Bonaquist").

However, in Applicant's A&R, Applicant amended claim 12 to write claim 12 in independent form, by including almost all limitations of original base claim 1. In other words, amended claim 12 is substantively almost identical to original claim 12. Therefore, because claim 12 is now rejected under §103(a) (over Maier, Rubin, and Bonaquist), while original claim 12 was rejected under only §102(b) (over Maier only), the rejection to claim 12 represents a new ground of rejection that was neither necessitated by Applicant's amendment of the claims nor based on information submitted in an information disclosure statement. The same arguments apply with regard to claims 3 and 13.

Finally, claim 11 was never even addressed in either the first or the final Office Actions. The Office Actions both contend that Maier discloses a valve that "is adjustable so that a flow rate of vapor passing through said valve may be adjusted...". However, neither Office Action ever contends that Maier discloses a valve that is "pressure regulating," as required by claim 11.

Examiner Zec is sincerely asked to withdraw the finality of the present Office Action. Applicant, a pro se inventor with limited resources, cannot justify the cost of an RCE, especially in the present case, in which the grounds for rejection of claim 11 have not been articulated, and claims 1, 3, 12, and 13 are finally rejected in spite of non-necessitated new grounds of rejection.

Claim Rejections

Claims 1, 3-7, 11, 14, 16-19, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Maier in view of Rubin. Claims 12, 13, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Maier in view of Rubin and Bonaquist. Claim

15 is rejected under 35 U.S.C. §103(a) as being unpatentable over Maier in view of Rubin and U.S. Patent No. 4,976,112 to Roberts et al. (hereinafter "Roberts"). Applicant respectfully traverses these rejections for at least the following reasons.

Claim 1 recites that the liquid comprises a refrigerant having a vapor pressure at room temperature greater than approximately 1 atm. The Office Action admits that Maier does not disclose this feature, but asserts that Rubin discloses that the use of carbon dioxide is "old in the refrigeration art." Applicant respectfully asserts that Maier and Rubin are not combinable in a manner to arrive at claim 1 for at least the following reasons.

No Motivation to Combine / Hindsight Reasoning

"When prior art references require selective combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself." Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143 (Fed. Cir. 1985). See also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017. There must be a teaching or suggestion within the prior art, within the nature of the problem to be solved, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources, to select particular elements, and to combine them as combined by the inventor. See Ruiz v. A.B. Chance Co., 234 F.3d 654, 665, (Fed. Cir. 2000); ATD Corp., 159 F.3d at 546; Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc., 21 F.3d 1068, 1072 (Fed. Cir. 1994). Citing references which merely indicate that isolated elements and/or features recited in the claims are known is not a sufficient basis for concluding that the combination of claimed elements would have been obvious. Ex parte Hiyamizu 10 USPQ2d 1393 (BPAI 1988). Further, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP 2143.01.

In the present case, it is insufficient to simply point out that use of carbon dioxide is old in the refrigeration art. There is no suggestion in any individual prior art reference

to combine the references in a manner to arrive at claim 1, nor is it suggested by the prior art as a whole. Where do the references suggest the desirability of using carbon dioxide in the invention of Maier? One of ordinary skill in the art is not motivated by the prior art to combine the references in a manner to arrive at claim 1.

Teaching Away

The Court of Appeals for the Federal Circuit has consistently held that it is "error to find obviousness where references 'diverge from and teach away from the invention at hand'." In re Fine, 5 U.S.P.Q. 2d 1596, 1599 (Fed. Cir. 1988).

The only disclosed working agent in Maier's refrigeration system is water, and Maier specifically discourages the use of any substance besides water. Maier states, "The use of water as the working agent permits the reduction of the required regulation expenditure to a minimum... The [water] ice layer can be used advantageously to regulate the liquid temperature... so that the liquid does not cool below 0°C, and usually, remains at 4-5°C." (Col. 3, lines 1-12.) Thus, Maier explicitly teaches away from the use of any working medium besides water. One of ordinary skill in the art would be taught away from using Rubin's carbon dioxide in Maier's water adsorption refrigeration system, at least in part because Rubin's solid carbon dioxide has a temperature of -109°F (-78°C) (col. 2, line 38 of Rubin), which is far too cold for Maier's desired temperature ranges.

Changing the Principle of Operation

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810 (CCPA 1959). Further, "the proposed modification cannot change the principle of operation of a reference." MPEP 2143.01.

Maier discloses a water adsorption refrigeration system operating under a vacuum. "Since with the use of water as the working agent the sorption apparatus is

under vacuum and no gases should penetrate into the system during the entire period of functioning, the known vacuum-tight components are to be preferred for the sealing-off device.” (Col. 3, lines 28-34.) Modifying Maier to use liquid carbon dioxide “at elevated pressure” as disclosed in Rubin (col. 1, lines 13-14) would impermissibly change Maier’s principle of operation from a vacuum system to a high-pressure system.

Further, Maier discloses a closed-loop refrigeration cycle, while Rubin discloses an open-loop cycle in which solid carbon dioxide, formed by expanding a supply of high-pressure liquid carbon dioxide, is used to cool food. (Rubin’s Abstract.) Modifying Maier’s closed-loop system as an open-loop system would impermissibly change its principle of operation. Thus, the teachings of the references are not sufficient to render the claims *prima facie* obvious.

For all of the above reasons, Maier and Rubin are not combinable in a manner to arrive at claim 1 of the present application. Claim 1, and all claims dependent therefrom, are believed to be patentable over the cited references. Withdrawal of the rejections is respectfully requested.

The dependent claims contain further patentable features.

For example, claim 11 recites that the valve is pressure regulating so as to prevent the first pressure from exceeding a predetermined maximum pressure. None of the cited references discloses, nor does the Office Action contend that any of the cited references discloses, this feature.

As another example, claim 14 recites that the valve is adjustable so that a flow rate of vapor passing through the valve may be adjusted. The Office Action contends on page 3 that Maier discloses this feature. Applicant respectfully disagrees. The cited disclosure (col. 4, lines 43-50) mentions only a valve, but does not disclose that the valve is adjustable. The cited references do not teach, disclose, or suggest a valve that is adjustable so that a flow rate of vapor passing through the valve may be adjusted.

As another example, claim 16 recites that the second reservoir has a volume at least ten times greater than a volume of the first reservoir. The Office Action on page 4 contends that “since vapor takes up a lot less volume than liquid it would have been

obvious to have the liquid reservoir to be much smaller than the vapor reservoir.” Applicant heartily disagrees. Maier discloses a water adsorption refrigeration system using zeolite as the adsorption substance which “bind[s] [the water molecules] in a phase similar to a liquid.” (Col. 2, lines 49-67.) In an adsorption system, the second reservoir need not have a large volume relative to the first reservoir, because the molecules of the working medium in the second reservoir are bound in the adsorption substance with a high density. Because of Maier’s use of an adsorbing substance, there is absolutely no need, nor disclosure, nor suggestion in Maier for the second reservoir to have a volume at least ten times greater than a volume of the first reservoir. Indeed, Fig. 1 in Maier shows evaporators 8 and zeolite-sorbent 14 having volumes of the same order of magnitude. The cited references do not teach, disclose, or suggest that the second reservoir has a volume at least ten times greater than a volume of the first reservoir.

As another example, new claim 23 recites that the second reservoir does not comprise an absorbent material to absorb the vapor. Maier does not teach, disclose, or suggest this feature.

Claim 12 recites that the cooling device further comprises a refrigerator comprising a second heat exchanger connected to at least one of the first and second reservoirs, the refrigerator configured to cool and condense the vapor during recharging of the cooling device. Claim 12 is believed to be patentable over the cited references for at least the same reasons regarding why Rubin’s carbon dioxide is not combinable with Maier’s water adsorption refrigeration system. (See above.)

Further, importing Bonaquist’s refrigerator into Maier (even as impermissibly modified by Rubin) would impermissibly change Maier’s principle of operation. MPEP 2143.01. Maier discloses the use of a heating plate 20 such that “the liquid coolers 1 are regenerated by applying the heating devices [to the adsorption substance] after refilling with beverages.” (Col. 5, lines 60-67.) Reuse of Maier’s system requires heating the adsorption substance. Using a refrigerator instead of a heater would impermissibly change Maier’s principle of operation.

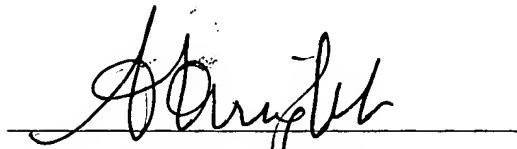
Therefore, the references are not combinable in a manner to arrive at claim 12 of the present application. Claim 12, and all claims dependent therefrom, are believed to be

patentable over the cited references. Withdrawal of the rejections is respectfully requested.

Conclusion and Fees

Because Applicant has paid for 20 claims and 3 independent claims, and because there are now 20 claims and 3 independent claims pending, Applicant believes that no fee is due. Applicant believes that all outstanding issues have been resolved, and respectfully requests a Notice of Allowance. Further, if claim 1 is found allowable, Applicant respectfully requests allowance of withdrawn dependent claim 21. If Examiner Zec believes that a telephone conference will further prosecution of the present case, he is invited to contact Applicant at the number indicated below.

Respectfully,

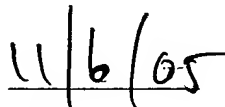


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